

# **AQUILINA ENVIRONMENTAL QUALITY CONSULTANTS**

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**Baseline Ecological Survey of Coy Pond Gardens, Poole**

**1<sup>st</sup> September 2003**

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## **Introduction**

A baseline ecological survey of the uppermost Coy Pond Gardens was carried out as part of planned groundworks scheduled for September 2003. This survey covered freshwater life in the stream itself and a plant survey of the surrounding banks and field which will be affected by the works. Results are presented as species lists and an interpretation of the scoring system. Comments are made on the likely value of the works.

## **Background**

A series of environmental enhancements are proposed for Coy Pond gardens in order to provide better access, to improve wildlife habitat, to clean up the stream and to reduce the risk of flooding. The first of these to be implemented will take place at the top end of the Havelock Road tributary where the stream emerges from a culvert under the railway embankment after a distance of 2.4 kilometres underground.

The proposed works consist of terracing the existing field to provide a flood plain for the stream; introducing channel meanders into this flood plain and planting with wet meadow species. At either end of this section an instream pond will be introduced planted up with appropriate species. New pathway and footbridges will be introduced to improve access. A rock splash pool will be built below a weir at one end of the lower pond.

Details of the proposed works can be found at  
[http://www.bournestreampartnership.org.uk/coy\\_pond\\_gardens.htm](http://www.bournestreampartnership.org.uk/coy_pond_gardens.htm)

## **Survey methods**

### **Freshwater**

Freshwater life in the stream was surveyed using a 3 minute standard sample including each of the habitats identified in the stream (pool, riffle, submerged vegetation, overgrowing bankside vegetation, and instream obstacles). The sample was collected in a standard pond net and sorted in the field. Vertebrates were returned to the water immediately, whilst invertebrates were removed for microscopic examination and identification.

### **Vegetation**

The site was small enough for the whole area to be walked and individual plants identified. However the area had been cut with strimmers a few days previously as part of the regular maintenance and therefore the identification opportunities were somewhat limited. Fortunately the bank vegetation was left intact and this was surveyed fully from the stream.

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### Survey results

#### Freshwater

The survey was carried out on Tuesday 26<sup>th</sup> August 2003.

The water parameters measured were :-

pH                    7.0  
 conductivity    322 µmol  
 temperature    16.4 °C.

Invertebrate species found are listed in the following table together with a BMWP (Biological Monitoring Working Party) score. This score is explained further in the Interpretation section.

Species	Common name	Family	BMWP score
<i>Lymnaea peregra</i>	Wandering snail	Lymnaeidae	3
<i>Potamopyrgus jenkinsi</i>	Jenkins spire shell	Hydrobiidae	3
<i>Physa</i> sp.	None (snail)	Physidae	3
<i>Ancylus fluviatilis</i>	River limpet	Ancylidae	6
<i>Polycelis nigra</i>	None (flatworm)	Planariidae	5
<i>Erpobdella testacea</i>	None (leech)	Erpobdellidae	3
<i>Lumbriculus variegatus</i>	None (worm)	Oligochaeta	1
<i>Eiseniella tetraeda</i>	None (worm)	Oligochaeta	1
<i>Asellus aquaticus</i>	Water hog-louse	Asellidae	3
<i>Crangonyx pseudogracilis</i>	Freshwater shrimp	Gammaridae	6
<i>Baetis rhodani</i>	Mayfly (large dark olive)	Baetidae	4
<i>Cordulegaster boltonii</i>	Golden-ringed Dragonfly	Cordulegasteridae	8
<i>Gerris lacustris</i>	Pond skater	Gerridae	5
<i>Notonecta glauca</i>	Water boatman	Notonectidae	5
<i>Plectrocnemia conspersa</i>	Caddisfly	Polycentropidae	7
<i>Rhyacophila dorsalis</i>	Caddisfly	Rhyacophilidae	7
<i>Culex</i> sp.	Mosquito	Culicidae	0
Chironomid sp.	Non-biting midge	Chironomidae	2
<i>Tipula</i> sp.	Crane fly	Tipulidae	5
<i>Eristalis</i> sp.	Hover fly	Syrphidae	0
<b>Totals</b>	20 species		76

In addition adult Golden-ringed Dragonfly (*Cordulegaster boltonii*) and Ruddy Darter (*Sympetrum sanguineum*) were noted patrolling the stream.

Two vertebrate species were also found; the Stickleback (*Gasterosteus aculeatus*) and the Common Frog (*Rana temporaria*).

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### Vegetation

The vegetation of the field was surveyed a few days after it was cut with trimmers therefore a number of plants may have been missed. However, all the indications are that this is an area of little botanical interest based on common grass and wasteland plants. Trees were excluded because the proposed works will cut them all down.

Common name	Species	Location
<b>Ferns</b>		
Bracken	<i>Pteridium aquilinum</i>	Field
Male fern	<i>Dryopteris filix-mas</i>	Bank
Hartstongue	<i>Phyllitis (Asplenium) scolopendrium</i>	Bank
<b>Sedges and Rushes</b>		
Pendulous sedge	<i>Carex pendula</i>	Bank
Compact rush	<i>Juncus conglomeratus</i>	Field
Jointed rush	<i>Juncus articulatus</i>	Field
Floating Clubrush	<i>Eleogiton (Scirpus) fluitans</i>	Stream
<b>Grasses</b>		
Perennial Rye-grass	<i>Lolium perenne</i>	Field
Creeping Soft-grass	<i>Holcus mollis</i>	Field
Yorkshire Fog	<i>Holcus lanatus</i>	Field
Cocksfoot	<i>Dactylis glomerata</i>	Field
Giant fescue	<i>Festuca gigantea</i>	Field
Red Fescue	<i>Festuca rubra</i>	Field
Annual Meadow grass	<i>Poa annua</i>	Field
Creeping Bent	<i>Agrostis stolonifera</i>	Stream
<b>Flowering plants</b>		
Bittersweet	<i>Solanum dulcamara</i>	Bank
Bramble	<i>Rubus fruticosus</i> agg.	Bank
Broad-leaved Dock	<i>Rumex obtusifolius</i>	Field
Broad-leaved Willowherb	<i>Epilobium montanum</i> agg.	Field
Herb Robert	<i>Geranium robertianum</i>	Field
Ragwort	<i>Senecio jacobaea</i>	Field
Spear Thistle	<i>Cirsium vulgare</i>	Field
Bristly Ox-tongue	<i>Picris echioides</i>	Field
Cut-leaved Cransbill	<i>Geranium dissectum</i>	Field
Birdsfoot Trefoil	<i>Lotus corniculatus</i>	Field
Meadow Buttercup	<i>Ranunculus acris</i>	Field, bank
Dandelion	<i>Taraxacum sect vulgaria</i>	Field
Common Catsear	<i>Hypochaeris radicata</i>	Field
Common Nettle	<i>Urtica dioica</i>	Bank
Ribwort Plantain	<i>Plantago lanceolata</i>	Field
Greater Plantain	<i>Plantago major</i>	Field
Water Plantain	<i>Alisma plantago-aquatica</i>	Stream
Curled Pondweed	<i>Potamogeton crispus</i>	Stream
Tutsan	<i>Hypericum androsaemum</i>	Bank
Lilac	<i>Syringa vulgaris</i>	Bank
Enchanters Nightshade	<i>Circaea lutetiana</i>	Bank

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Hemp Agrimony	<i>Eupatorium cannabinum</i>	Bank
Hemlock Water Dropwort	<i>Oenanthe crocata</i>	Stream, bank
Clover	<i>Trifolium repens</i>	Field
Knotgrass	<i>Polygonum aviculare</i>	Field

### Interpretation and comments

The results of the freshwater survey show a rather restricted range of invertebrates compared with other reaches of the Bourne Stream. The BMWP scores reflect the sensitivity of the Family to organic pollution, thus the presence of species with scores of up to 8 (the most sensitive species score 10) show that the stream is not unduly affected by pollution or organic enrichment.

The site's total BMWP score of 76 suggests it is moderately clean (values greater than 100 are associated with clean rivers and values less than 10 with heavily polluted waters).

The reasons for the paucity of species are likely to be threefold.

1. Vertical, mostly concrete, embankments offer little in the way of shoreline for invertebrates or plants, thus habitat diversity is restricted.
2. Lack of submerged or emergent vegetation will severely restrict habitats for invertebrates. There are only small patches of *Potamogeton crispus*, *Alisma plantago-aquatica* and *Eleogiton fluitans* actually submerged and small patches of overhanging *Agrostis stolonifera* and *Oenanthe crocata*.
3. The quality of the water emerging from the culvert. As this has been underground for some distance, there will have been no primary production and therefore will be low on food content. It also shows a red-brown deposit of bacteria (and iron?) which coats the bottom and any submerged plants, thus restricting the ability of plants to grow at this point in the stream.

The proposed works will address the first issue directly and as a consequence will improve conditions for submerged and emergent vegetation (point 2 above). The siting of the pond should capture the water emerging from the culvert and filter it through reedbeds which will restrict the deposit and improve conditions further downstream. The proposed weir and rock splash pool should also increase the oxygen content of the water which will also improve the water quality downstream.

A previous survey carried out by Peter Brett Associates in 2001 for the Bourne Valley SUDS feasibility study<sup>1</sup> found a limited range of aquatic invertebrates and concluded that the stream was in 'poor to fair condition with indicator species dominated by pollution tolerant organisms'. The samples taken from the inflow below the railway embankment (2P and 2G) were from the same point as this current survey and, although a different sampling strategy was employed, the results can be approximately compared. The macroinvertebrate family list can be converted to BMWP scores and these are 19 (2P) and 29 (2G) and give a combined score of 35, therefore the stream shows an improvement since 2001. A second set of samples for the 2001 survey was also taken at a point further downstream (Branksome Wood Road) from the current sampling location and these gave BMWP scores of 23 (1P), 34

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<sup>1</sup> Study results available from sarah@bournestreampartnership.org.uk

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(1G) and a combined score of 44. This slightly better score reflects the greater diversity due to greater habitat heterogeneity, more diverse plant life and greater distance from the issue point of the culverted section.

The proposed planting scheme should positively improve the number of wetland plants which are currently rather limited, which in turn should benefit the invertebrate species richness. However it is important to plant the bare areas quickly in order to present a 'cared-for' look to local residents and to establish plant cover in order to restrict invasion by less desirable species. Sources for such invasion will be the seed of existing species which are typically waste ground species rather than wetland. Another potential problem is the number of potentially invasive alien species downstream which include Himalayan Balsam (*Impatiens glandulifera*), Canadian Goldenrod (*Solidago canadensis*), and Cape Pondweed (*Aponogeton distachyos*). Although these are currently restricted to streamside, they were presumably planted there by local residents trying to 'improve' the gardens. An unfinished look might provoke such inappropriate gardening.

### **Summary**

This baseline survey shows a section of stream with little variety and plenty of opportunities to increase habitat diversity. The vegetation survey shows a field of little botanical interest.

Comparison with previous data suggests that the stream has improved since 2001 as a result of works carried out upstream. The potential for biodiversity in the stream would appear to be limited more by physical and structural components than chemical or organic pollution. Therefore the proposed works should improve both the stream and surroundings by offering an increase in the range of habitats available.